Aug. 21, 1934. E. F. MARTINET 1,970,665

SUCTION CLEANER

Filed April 10, 1931

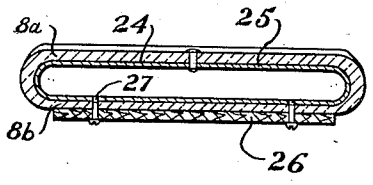


Fig. 4

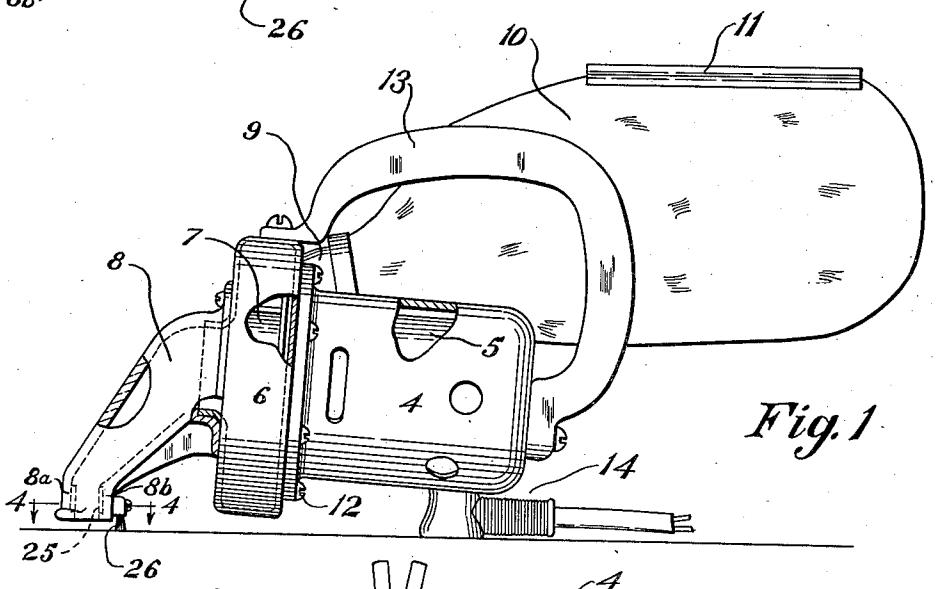


Fig. 1

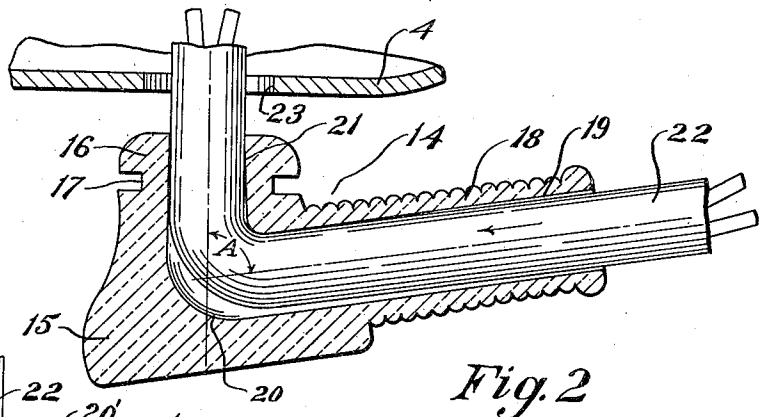


Fig. 2

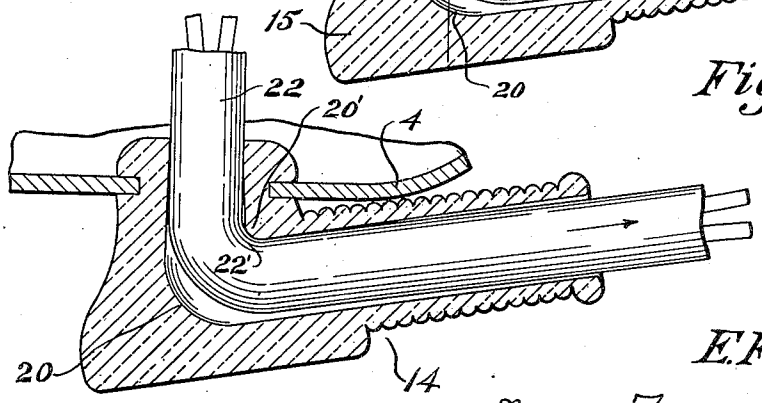


Fig. 3

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Patented Aug. 21, 1934 1,970,665

UNITED STATES PATENT OFFICE

1,970,665

SUCTION CLEANER

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Application April 10, 1931, Serial No. 529,135

15 Claims. (Cl. 15—15)

The invention relates to suction cleaners and more particularly to the smaller sizes of the same, commonly called hand cleaners, which are sufficiently light enough in weight that they may be conveniently carried by an operator, in one hand, and so used for cleaning or dusting draperies, curtains, blankets, mattresses, pillows, walls, furniture, upholstery, pictures, higly polished surfaces, and the like.

A serious objection to the hand type cleaner is that the usual hard metal wall of the fan and/or motor housing contacts with the surface on which the machine is laid, or over which the machine is operating. Thus, when such a cleaner is used for dusting highly polished surfaces and the like, or when the cleaner is used in the vicinity of the same, such surfaces frequently are scratched, marred or dented by the hard metal walls.

Accordingly it is an object of the present invention to provide a soft, non-abrasive, yielding guard or foot-rest member for a hand cleaner, which supports or maintains the metal parts of the same in spaced relation from the surface being cleaned, or upon which the cleaner is laid, for preventing the cleaner from scratching or marring such surfaces.

A hand cleaner usually is electrically operated and accordingly is equipped with a power supply wire cord which leads through the metal motor housing wall to the motor therein. It is therefore necessary to supplement the cord insulation with an insulating bushing for the opening in the metal motor housing through which the cord passes.

Moreover, it is desirable to anchor the cord so that it cannot be pulled or jerked loose from the motor connections therefor, during use, as when the cord extending to a power socket is snagged or caught on a piece of furniture or the like.

Also, it is desirable if not necessary to prevent the cord from being sharply bent or flexed during use, at or adjacent the place where it passes through the motor housing, to avoid damage or injury to the cord at that place.

And finally, it is essential to manufacture hand cleaners as simply, and inexpensively as possible, so that the cleaners will have a very low selling price to the purchaser.

It is therefore a further object of the present invention to provide a hand cleaner with a combined one-piece foot-rest and cord anchor, guard and insulating bushing member made of a homogeneous, insulating, wear-resisting, non-abrasive, soft, resilient, yielding material.

The nozzle of a hand cleaner is usually formed of aluminum, cast integrally with the fan housing thereof. Such a metal nozzle during use frequently scratches, mars, or dents a highly polished surface, which is being cleaned or dusted by the cleaner, and may damage upholstery by use of a metal nozzle directly thereon.

Moreover, it has been found that aluminum is characterized by the fact that it rubs off on light colored fabrics or the like by contact therewith and produces stains, streaks or spots thereon. Thus, when a hand cleaner having an aluminum nozzle is used for cleaning light colored curtains, it frequently leaves dark discolorations thereon, in being passed back and forth over the fabric.

Accordingly, it is a further object of the present invention to provide a hand cleaner with a nozzle made of a homogeneous, wear-resisting, non-abrasive, soft, resilient, yielding material to avoid scratching highly polished surfaces being cleaned, to avoid staining, streaking or spotting light colored materials being cleaned, and to avoid damage to upholstery and the like.

These and other objects may be attained by providing a construction, a preferred embodiment of which is hereinafter described in detail and shown in the drawing, which may be stated in general terms as including a suction cleaner having a motor and metal motor housing, and a fan and metal fan housing, a nozzle member made of a non-abrasive, wear-resisting, soft, yielding material preferably rubber, connected to the metal fan housing, and a combined one-piece foot-rest and cord anchor, guard and insulating bushing member made of an insulating, non-abrasive, wear-resisting, soft, yielding material also preferably rubber, connected to the metal motor housing.

In the drawing, Figure 1 is a side elevation partly in section of a hand type suction cleaner embodying the present improvements;

Fig. 2 is a longitudinal sectional view through the improved combined one-piece foot-rest and cord anchor, guard and insulating bushing, showing the manner of assembling the same in connection with the motor housing;

Fig. 3 is a view similar to Fig. 2 showing the improved foot-rest assembled in connection with the motor housing; and

Fig. 4 is a section through the nozzle lip walls taken on the line 4—4, Fig. 1.

Similar numerals refer to similar parts throughout the various figures of the drawing.

A hand type suction cleaner is shown in Fig. 1, which includes walls forming a motor housing 4 for the motor 5, and walls forming the

fan housing 6. A fan 7 is mounted for rotation within the fan housing 6 on the shaft of the motor 5. Rotation of the fan 7 causes air currents to be drawn into the nozzle 8, and into the chamber formed by the fan housing 6, the air currents then being exhausted through the fan chamber exhaust outlet 9 and into and through the dust bag 10, which may be provided with an opening, closed by any suitable means 11, for emptying the contents of the bag therethrough.

The motor housing 4 and fan housing 6 preferably constitute two separate aluminum castings connected together by any suitable means 12, and the same are provided with a handle 13 for carrying and manipulating the cleaner.

The nozzle 8 is made of a non-abrasive, wear-resisting, soft yielding material, which is preferably molded rubber, so that a cleaner equipped with such a nozzle may be used to clean or dust highly polished surfaces without danger of marring, denting or scratching the same.

The lip walls 8a and 8b are preferably provided with an internal recess 24 in which is positioned a strip metal loop 25 for reinforcing the rubber lip walls against collapse when the cleaner is being operated. A brush 26 is preferably provided on the rear lip wall 8b, by riveting the same at 27 through the wall to the loop 25.

A nozzle made of soft yielding material, as distinguished from the usual cast aluminum nozzle, cannot damage upholstery in cleaning the same.

In addition, a nozzle made of soft rubber does not have any tendency to dirty, streak, or soil the material being cleaned, as is the case with the usual nozzle made of aluminum. Moreover, the use of a molded rubber nozzle enables hand cleaners to be attractively made with appealing color combinations, which render the same more salable.

And finally, the usual cast aluminum nozzle must have its outer surface polished, while a molded rubber nozzle is not required to be polished and the same may be made and assembled on a suction cleaner fan casing much more inexpensively than a vacuum cleaner having a polished aluminum nozzle.

The improved combined foot rest and cord anchor guard and insulating bushing member generally indicated at 14 is also made of an insulating, non-abrasive, wear-resisting, soft, yielding material, also preferably molded rubber. Such a rubber foot-rest member cooperates with the rubber nozzle 8 to form a soft, non-abrasive support for the vacuum cleaner fan and motor housing so that the use of the hand cleaner will not subject polished surfaces to the liability of being scratched, dented, marred, or otherwise damaged.

The particular design of the foot-rest member 14 is important, and preferably includes a base portion 15 having a cylindrical bushing portion 16 extending upwardly integrally therefrom, the bushing portion being provided with an annular recess 17 adjacent its upper end. A tubular cord guard portion 18 extends outwardly from one side of the base portion 15, the tubular passageway 19 therein communicating with an enlarged angular chamber or bend 20 provided in the base portion 15 and terminating in a slightly tapered tubular passageway 21 through the bushing portion 16.

The angle A between the axis of the tubular openings 19 and 21 is preferably less than a right angle, while the cross sectional area of the chamber 20 is greater than the cross sectional areas of the passageways 19 and 21, for reasons which will be hereinafter described.

Referring to Fig. 2, the wire cord 22 may be readily inserted through the communicating passages 19, 20 and 21 of the foot-rest member 14 by inserting a free end of the cord wire through the openings in the direction indicated by an arrow in Fig. 2, the chamber 20 being enlarged in cross section to facilitate inserting the cord wire therethrough. The wire ends may then be suitably connected to the terminals of the motor 5 so that the motor may be operated when a plug connected to the other end of the cord wire 22 is electrically connected to a suitable source of power.

In view of the fact that the member 14 is made of soft, insulating, yielding material, the bushing portion 16 thereof may then be inserted through an opening 23 provided in a lower wall of the motor casing 4, so that the wall 4 will be resiliently engaged in the annular recess 17 of the bushing portion 16, as shown in Fig. 3, in which the bushing portion 16 is for all practical purposes substantially permanently connected to the motor housing wall 4, and insulates the wires of the cord 22 therefrom.

When the parts are assembled in the position shown in Fig. 3, a pull on the cord 22 in the direction shown by the arrow in Fig. 3 causes the flexibly bent portion 22' thereof to snugly hug the relatively sharp upper angular corner 20' of the base member chamber 20.

Since the foot-rest member 14 is formed of a soft, yielding material, and since the angle A is less than a right angle, the cord 22 and angular corner 20' bind each other so as to substantially permanently anchor the cord in the foot-rest member against being pulled out, which would cause the wires of the cord 22 to be loosened from their connections with the terminals of the motor 5.

The walls of the tubular guard portion 18 of the foot-rest member 14 are flexible, but yet thick enough that the cord 22 cannot be sharply flexed or bent. For these reasons, successive bending or flexing forces to which the cord 22 is always subjected in use will not result in injuring, breaking, wearing through, or short-circuiting the wires thereof at or adjacent the place where it passes through the motor housing wall 4, as may be the case with suction cleaner cords which are not equipped with the present improvement.

And finally, the non-abrasive and wear-resisting character of the material of which the foot-rest member 14 is made prevents the same from scratching, marring, or otherwise injuring surfaces over which the cleaner may be passed, and always maintains the metal parts thereof in spaced relation from such surfaces.

I claim:

1. In a hand cleaner having metal motor and fan housing walls, a nozzle member made of soft, yielding material and a foot-rest member made of soft, yielding material, the nozzle and foot-rest members being connected to and projecting from the metal housing walls to provide a non-abrasive support for the cleaner.

2. In a hand cleaner having a metal fan housing and a metal motor housing, a nozzle member made of soft, yielding material connected to and projecting from the metal fan housing and a foot-rest member made of soft, yielding material con-

nected to and projecting from the metal motor housing to provide a non-abrasive support for the cleaner.

3. In a hand cleaner having a metal fan housing and a metal motor housing, a rubber nozzle member connected directly to and projecting from the fan housing and a rubber foot-rest member connected to and projecting from the motor housing to provide a non-abrasive support for the cleaner.

4. In combination with a hand cleaner having a housing wall, a soft rubber foot-rest member connected to and projecting from the housing wall, and means on the foot-rest member resiliently connecting it to the housing wall.

5. In combination with a hand cleaner having a housing wall, a rubber foot-rest member having an opening therethrough projecting from the housing wall and provided with an integral bushing portion connected to the housing wall.

6. In combination with a hand cleaner having a housing wall, a hollow rubber foot-rest member connected to and projecting from the housing wall, a flexible cord located through the hollow foot-rest member and extending to a place within the housing, and the foot-rest member including a tubular cord guard portion extending integrally therefrom through which the cord passes.

7. In combination with a hand cleaner having a housing wall, a hollow rubber foot-rest member projecting from the housing wall provided with an integral bushing portion connected to the housing wall, a flexible cord located through the hollow foot-rest member and bushing portion and extending to a place within the housing, and the foot-rest member including a tubular cord guard portion extending integrally therefrom through which the cord passes.

8. In combination with a hand cleaner having a housing wall, a rubber foot-rest member connected to and projecting from the housing wall, there being a passageway through the foot-rest member, a flexible cord extending through the passageway to the interior of the housing, and the passageway being provided with an acute angular bend cooperating with the cord for anchoring the cord to the foot-rest member against pulling out.

9. In combination with a hand cleaner having a housing wall, a rubber foot-rest member projecting from the housing wall provided with an integral bushing portion connected to the housing wall, the foot-rest member including a cord guard portion extending integrally therefrom angularly with respect to the bushing portion, there being a passageway through the foot-rest member and bushing and guard portions thereof, a flexible cord extending through the passageway to the interior of the housing, and the passageway being provided with an acute angular bend cooperating with the cord for anchoring the cord therein against pulling out.

10. A combined one-piece rubber foot-rest member and cord anchor, guard and bushing for a suction cleaner, said member having a base portion, a bushing portion, and a guard portion, and there being an angular cord passageway through the foot-rest member portions.

11. A combined one-piece rubber foot-rest member and cord anchor, guard and bushing for a suction cleaner, said member having a base portion, a bushing portion extending from the base portion, and a guard portion extending from the base portion at an acute angle with respect to the bushing portion, and there being an angular cord passageway through the foot-rest member portions.

12. A combined one-piece rubber foot-rest member and cord anchor, guard and bushing for a suction cleaner, said member having a base portion, a bushing portion extending from the base portion, and a guard portion extending from the base portion at an acute angle with respect to the bushing portion, and there being an angular cord passageway having a varying cross sectional area through the foot-rest member portions.

13. A combined one-piece rubber foot-rest member and cord anchor, guard and bushing for a suction cleaner, said member having a base portion, a bushing portion, and a guard portion, and there being a cord passageway through the foot-rest member portions and having an acute angular portion of enlarged cross section.

14. In combination with a suction cleaner having a housing wall, a soft rubber nozzle connected to and projecting from the housing wall, means on the interior of the lip walls for reinforcing the lip walls of said nozzle against collapse, and a brush connected to the exterior one of the lip walls and to the reinforcing means.

15. A soft rubber nozzle for a suction cleaner having lip walls forming a mouth, there being an internal recess in said lip walls, means located in said recess for reinforcing the lip wall against collapse, a brush, and means connecting the brush to the reinforcing means and clamping one of the lip walls therebetween.

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